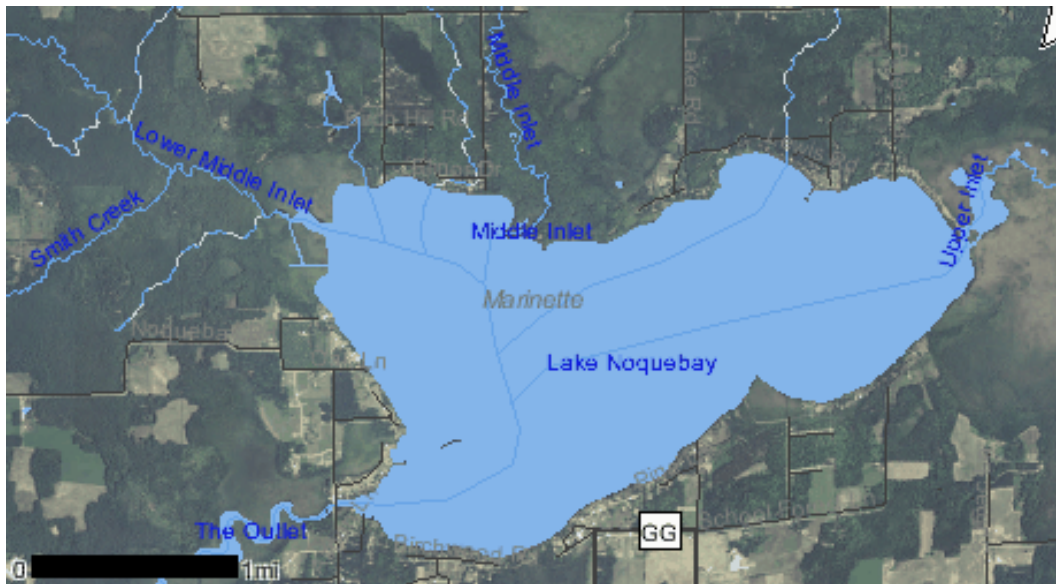


Lake Noquebay, Marinette County, Wisconsin Fisheries Survey Report, 2009

Waterbody Identification Code: 525900

Lake Noquebay, Marinette County, Wisconsin



Michael Donofrio
Fisheries Supervisor
Wisconsin Department of Natural Resources
Peshtigo, Wisconsin
September 2010

**Lake Noquebay, Marinette County, Wisconsin
Fisheries Survey Report, 2009**

Report Approval signatures

Michael Donofrio, Fisheries Supervisor, Date

George Boronow, Regional Fisheries Supervisor, Date

Andrew Fayram, Bureau of Fisheries Management, Date

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SUMMARY

Lake and location

Lake Noquebay, Marinette County, T32N R21E Sec 8

Physical / chemical attributes (Carlson et al, 1975)

Surface acres: 2,409

Mean depth: 10 feet

Maximum depth: 51 feet

Lake type: drainage water body with watershed area of 45 square miles and 1,000 acres of adjoining wetlands.

Basic water chemistry: Slightly alkaline, stained light brown and moderate transparency

Littoral substrate: 70% sand, 25% muck and 5% gravel

Aquatic vegetation: Persistent, 75-80% of the lake supported macrophyte vegetation and 10-15% was occupied by emergent or floating leaf vegetation.

Other features: The lake association consists of over 250 members. Marinette County Land and Conservation Department maintains a low head dam at the outlet and conducts a minor winter drawdown to control aquatic vegetation. This lake has three inlets: Middle Inlet, Upper Inlet and Lower Inlet.

Purpose of surveys

Spring and Fall Electrofishing assessments

Dates of fieldwork

Fyke netting surveys April 9-23, 2009. Electrofishing surveys conducted April 16, May 4-5, June 4, and October 13-14, 2009.

Fishery

Largemouth bass, northern pike, bluegill, rock bass, black crappie, pumpkinseed are abundant. Yellow perch and walleye are common. Muskellunge and smallmouth bass present.

BACKGROUND

Lake Noquebay is a 2,409 acre lake and the largest inland lake in Marinette County, Wisconsin. It's located approximately 3 miles east of Crivitz, WI. It has a mean depth of 10 feet and a maximum depth of 51 feet. The water level is controlled by a low head dam maintained by the Marinette County land and Conservation Department. Water level in the lake is held between 666.2 and 666.6 ft. Between October 15 of each year and ice out, the lake is drawn to 664.95. The three major tributaries are Middle Inlet, Lower Middle Inlet and Upper Middle Inlet. There are several access points on the lake including Lake Noquebay County Park.

Currently, this lake is free of the invasive species Eurasian water-milfoil (*Myriophyllum spicatum*) and Curly-leaf pondweed (*Potamogeton crispus*). The native species various-leaved water-milfoil (*Myriophyllum heterophyllum*) has been invasive since it became established in the lake. Farwell's water-milfoil (*Myriophyllum farwellii*) is listed by the DNR as a species of special concern is found in the lake. The harvest of Wild Rice is regulated on the lake. Lake Noquebay has many areas of bulrush beds that are in need of protection. This lake also has zebra mussels.

A Critical Habitat Designation Report was completed for Lake Noquebay in 2009. The Critical Habitat Designation Program was created to identify and provide protection for areas of lakes and streams that provide important fish and wildlife habitat, water quality and quantity protection, navigational routes, and natural scenic beauty. In this lake, 12 areas were identified for specific habitat protection. Habitat protection included: protect emergent vegetation, maintenance of fallen trees, no alteration of littoral zone, and limited vegetation harvest along specific segments of the shoreline. Wisconsin DNR will consider the content and recommendations of this report when issuing permits.

Wisconsin DNR stocked Lake Noquebay regularly with walleye fingerling through 2000 with private stocking occurring over the last 10 years. WDNR stocked 1,000 muskellunge fall fingerlings from 1990 through the present. The last comprehensive survey was conducted in 1996 including spring fyke netting, spring and fall electrofishing. The inlets to Lake Noquebay are trout streams so trout species may be fished in this lake according to appropriate regulations (Table 1). Fishing pressure is thought to be high throughout the year. It is also popular with recreational boaters. Motor trolling is permitted on this lake.

METHODS

Data collection

Fourteen standard 4 foot fyke nets with $\frac{3}{4}$ inch bar, 1.5 inch stretch mesh were fished from April 9th through April 23rd. A WDNR standard direct current electrofishing boat was used to sample 4 miles of shoreline on the evening of April 16, 2.0 miles of shoreline on May 4-5. On June 4, we sampled 2 miles of shoreline and 8 miles of shoreline on October 13-14, 2009 (see attachments). All species were processed during fyke netting. Only walleye were captured and processed on the April 16th. In May and June, all fish captured were identified to species and counted for the first $\frac{1}{2}$ mile and only game fish during the succeeding 1.5 miles each evening. The October sampling event targeted juvenile walleye and muskellunge as a sign of recruitment. Total length of gamefish and a sub-sample of panfish were measured to the nearest 0.1 inch. Scales or dorsal spines were collected from a sub-sample of fish stratified within 0.5 inch bins. Ages were assigned to fish after scales and spines were aged using standard WDNR procedures.

Data analysis

Total catch and catch per gear type was calculated for all species. Length frequency distributions were performed for northern pike, walleye, largemouth bass, bluegill, black crappie, pumpkinseed, yellow perch, rock bass, yellow and brown bullhead. A subsample of walleye, northern pike, largemouth bass, black crappie, rock bass, pumpkinseed, yellow perch and bluegill were aged for comparisons with previous surveys. A description of the sex ratio was analyzed for walleye, northern pike and yellow perch. Proportional Stock Density (PSD) and Relative Stock Density of preferred length fish (RSD-preferred, Anderson and Neumann 1996) were calculated for muskellunge, walleye, largemouth bass, northern pike, rock bass, bluegill, pumpkinseed, black crappie and yellow perch. Stock length, quality length, and preferred length values were used as proposed by Gabelhouse (1984).

RESULTS AND DISCUSSION

A total of 6,389 fish of 24 different species were collected in 2009. 1996 and 2009 catch by date and catch rates are shown for most species sampled at Lake Noquebay (Table 2). Walleye was the most abundant gamefish species in 2009 fyke netting followed in total catch by northern pike and largemouth bass. During 1996 fyke netting, northern pike was the most abundant gamefish in the nets followed in total catch by walleye and largemouth bass. The 2009 catch rate for walleye (3.41 fish per net night) was nearly twice the 1996 level. Even though fyke nets are not the best gear for catching bass species, 392 largemouth bass were seen in 2009 compared to only 62 in 1996. The catch rate for northern pike was down from 3.19 per net night in 1996 to 2.75 in 2009. The Wisconsin DNR began stocking muskellunge into Noquebay in 1990 but were not captured during the 1996 surveys. In 2009, 19 muskellunge were captured in fyke nets and one during electrofishing. Electrofishing catch rate in 2009 was lower than 1996 for walleye, northern pike and largemouth bass.

During 2009 fyke netting, bluegill was the most abundant panfish species in total catch followed in decreasing abundance by rock bass, black crappie and pumpkinseed. No yellow perch were captured in 1996 fyke nets but 85 were caught in 2009. In 1996, the panfish catch rate for all species was significantly lower than in 2009. However, the electrofishing catch rate was higher in 2009 for bluegill and pumpkinseed than 1996. The electrofishing catch rate was lower for black crappie, rock bass, and yellow perch. Other species captured were warmouth, bowfin, redhorse species, lake chub sucker, white sucker, long nose gar, and brook trout. 402 bullhead species were netted in 2009 compared to only 135 in 1996. Bullhead species were abundant in 2009 fyke nets. The fyke net catch rate for bullhead species was three times higher in 2009 compared to 1996.

Largemouth Bass

During 2009 fyke netting efforts, 392 largemouth bass were captured and electrofishing yielded 165 fish. 1996 and 2009 length frequency distributions for largemouth bass were similar with good representation of juvenile and adult fish (Figure 1). The 2009 PSD value was 76% compared to 78% in 1996. The average size was 14.9 inches in 2009 and

14.7 inches in 1996. During 2009 electrofishing survey, 165 largemouth bass ranging from 7.7 to 21.5 inches were captured compared to 47 largemouth bass in the 1996 electrofishing surveys. During electrofishing, the average size of the largemouth bass was 13.3 inches in 2009. A representative sample of largemouth bass was aged in 2009 from 3 to 15 years. The 2009 aged fish indicated a generally slower growth rate when compared to northeast region of Wisconsin (NER) average length at age (Table 3). The bass aged at 3 and 4 years were comparable to the NER averages but growth rates were slower for ages 5-15. A population estimate could not be calculated for largemouth bass.

Walleye

2009 netting results yielded 630 walleye ranging from 9.1 to 24.2 inches. The fyke net catch rate was nearly double the rate from 1996 surveys. The 2009 average length of netted walleye was 15.4 inches compared to 16.8 inches in 1996. The length frequency distribution indicated that smaller walleye were in the population in 2009 compared to 1996 (Figure 2). The 2009 PSD value was 42% and the RSD 20 value was 8% so a significant portion of the population is legal angler size at 15 inches. Therefore, more walleye were captured in 2009 than 1996, but they were smaller in size.

During 2009 electrofishing surveys, 89 walleye were captured and they were mostly found around the islands on the lake. These islands were improved to increase walleye spawning on this lake. Those walleye ranged from 9.8 to 20.2 inches with an average of 15.0 inches. The Schumacher- Eschmeyer fyke net population estimate was 1,313 walleye with 95% confidence intervals of 1,027 to 1,821 and 19% recapture rate. A representative subsample of 185 walleye was aged from 3 to 15 years (Table 4). Walleye growth rates were slower than Northeast Wisconsin average length at age for all years. We did not sample any juvenile walleye during the fall 2009 electrofishing survey, so we don't have evidence of natural recruitment.

Northern Pike

2009 fyke nets yielded 508 northern pike ranging from 11.6 to 36.5 inches. The average size of netted pike in 2009 was 17.4 inches compared 16.0 inches in 1996. The comparisons of the 1996 and 2009 length frequencies indicated a general shift to smaller pike in 2009 (Figure 4). The 2009 PSD value was 12% and 8% in 1996. RSD 28 was 2%

in 2009 and 1% in 1996. Electrofishing surveys revealed only 27 pike with an average size of 16.5 inches and a range of 9.8 to 28.4 inches. A length frequency by sex sorted as 61 females with an average size of 17.9 inches, 179 males with an average size of 16.0 inches and 258 of unknown sex with an average size of 18.2 inches (Figure 5). The 2009 northern pike growth rates were slower than the State average (Table 5). The average northern pike from Lake Noquebay was nearly 5 inches smaller per age than the State average for that species. The Schnabel fyke net population estimate was 5,169 northern pike with 95% confidence intervals of 3,652 to 8,842 and 5% recapture rate.

Bluegill

The 2009 fyke netting surveys yielded 1,928 bluegill. Those fish ranged in size from 3.4 to 9.7 inches and the average length was 6.4 inches. In 1996, a sample of 345 fyke netted bluegill yielded an average size of 5.5 inches and a range of 3.6 to 9.4 inches. The 1996 and 2009 length frequency distribution represented high numbers of juvenile and adult bluegill representing several inch groups (Figure 6). However, the overall size structure was skewed towards larger fish in 2009. The 2009 PSD value was 62% and 27% in 1996. The RSD 8 was 9% in 2009 and 1996. The 2009 electrofishing surveys produced 128 bluegills ranging from 3.4 to 8.4 inches, with an average size of 6.1 inches. Bluegill from 2-9 years were aged from a 104 fish subsample (Table 6). The growth rates were comparable for all ages with the NER average length at age.

Rock Bass

Rock bass were abundant in the 2009 fyke net survey with 1,130 fish. The 1996 net survey revealed 241 rock bass. The average size of rock bass in 2009 was 7.4 inches with a range from 3.3 to 11.4 inches. In 1996, rock bass size ranged from 3.9 to 10.8 inches with an average of 7.5 inches. The length frequency distributions for 1996 and 2009 were comparable with increases in the number of rock bass from the 5-7 inch groups from 1996 to 2009 and decreases in the 8-10 inch rock bass from 1996 to 2009 (Figure 7). The 2009 PSD value was 60% and 69% in 1996. The 2009 RSD 9 value was 21% and 24% in 1996. The 2009 electrofishing surveys produced only 13 rock bass with an average length of 5.7 inches. A subsample of 101 rock bass was aged in 2009 (Table 7). Those fish ranged from 3 to 10 years and growth rates were compared with NER Wisconsin average

length at age data. Lake Noquebay rock bass were slower growing for ages 3 and 4, but exceeded the State average length at age for years 5-10.

Pumpkinseed

Pumpkinseed were an abundant panfish species in the 2009 netting survey. Fyke nets captured 252 pumpkinseed in 2009 compared to 30 in 1996. The 2009 size range was 4.0 to 9.1 and averaged 6.8 inches. The 1996 average size was 5.4 inches with a range from 4.2 to 8.2 inches. The 2009 length frequency indicated good representation of juvenile and adult pumpkinseed (Figure 8). The 2009 PSD value was 81% and RSD 8 was 10%. The 2009 electrofishing surveys yielded 13 pumpkinseed with an average length of 6.4 inches. A subsample of 28 pumpkinseed were aged in 2009 and compared to the State average length at age data (Table 8). Pumpkinseed aged at 3 years were less than the State average but Lake Noquebay pumpkinseed exceeded the average length at age for ages 4-8.

Black Crappie

In 2009, 290 black crappie were captured in fyke nets compared to 118 in 1996. Those ranged from 4.8 to 12.3 inches with an average length of 9.4 inches for 2009. In 1996, black crappie ranged from 4.7 to 13.4 inches and averaged 10.5 inches. Length frequency distribution indicated a good representation of juvenile and adult black crappie (Figure 9). The 8 and 9 inch groups were much higher in the 2009 net surveys but in the 10-13 inch groups, more fish were found in 1996 than 2009. The 2009 PSD value was 87% and 93% in 1996. The RSD 10 was 40% in 2009 and 76% in 1996. This data documented a very good 2009 size structure for adult black crappie but less than 1996 values. 2009 electrofishing surveys yielded 68 black crappie ranging from 6.9 to 12.8 inches. The average size of the black crappies in 2009 was 8.6 inches in those surveys. A subsample of 101 black crappie were aged from 2-9 years (Table 9). The growth rates of those fish met or exceeded the growth rates of black crappie from other NER Wisconsin lakes.

Yellow Perch

Fyke netting in 2009 resulted in the capture of 85 yellow perch. No yellow perch were captured during 1996 netting efforts. The size range of those perch was 5.0 to 11.3 inches with an average size of 7.8 inches. The netting surveys revealed a good size distribution for yellow perch for sub-adult and adults (Figure 10). The 2009 PSD value was 42% and RSD 10 was 8%. A length frequency by sex distribution indicated that few males were observed in the surveys and females composed 67% of the sexed yellow perch (Figure 11). Since frequently male perch are easily sexed, the unknown perch would tend to be females. Only one 3.8 inch perch was captured during electrofishing surveys. Seventy-three percent (N= 62) of the sampled yellow perch were aged from 3 to 7 years (Table 9). The length at age of those fish met or exceeded the average length at age of yellow perch for northeast Wisconsin lakes.

Muskellunge

Fyke nets captured 19 muskellunge in 2009. Those fish ranged from 12.0 to 45.2 inches and the average size was 37.8 inches. Five of those musky were sexed as males with an average length of 36.9 inches and the average size of 6 females was 40.5 inches. Two of those musky had hatchery finclips. No musky were observed during 1996 surveys. The 2009 PSD value was 94% and RSD 38 was 67%. Only one musky was caught during 2009 electrofishing surveys and it was 11.5 inches. That fish was finclipped, so it was likely a stocked fish from 2009. Although sample size per age was small, the length at age values for Lake Noquebay musky were comparable to the same data for other northeast Wisconsin lakes (Table 11).

Other Species

Other fish species observed during the 2009 surveys were warmouth, bowfin, bullhead (black, brown, and yellow), redhorse (shorthead, golden, silver), white sucker, long nose gar and blunt nose minnows. A 2009 length frequency distribution of yellow and brown bullheads indicated that yellow bullhead ranged from 8 to 13 inches while brown bullheads were larger from 10 to 15 inches (Figure 12). The 1996 surveys also yielded warmouth, lake chubsucker, white suckers, bowfin, red horse species and bullhead species. One brook trout at 11.9 inches was captured during the October of 2009

electrofishing survey. Two brown trout were observed during the 1996 spring netting surveys at 22.7 and 25.1 inches.

CONCLUSIONS AND RECOMMENDATIONS

The 2009 Lake Noquebay surveys revealed a diverse fishery and comparable in species richness to the 1996 surveys. Overall, the fishery of Lake Noquebay appears to be in good condition. In 2009, surveys indicated a fishery strongly dominated with largemouth bass and northern pike as the dominant predators with a diverse panfish community supported by bluegill, rock bass, and pumpkinseed. The 2009 surveys documented the presence of muskellunge for the first time since stocking began in 1990.

Largemouth bass are a dominant predator and the 2009 surveys indicated this population is in very good condition as described by the size structure of this fishery. Growth rates could be better but may be indicative of a small exploitation rate and/ or high bass density. Northern pike density is high but the size structure is dominated by pike under twenty inches. Nearly 90% of the pike surveyed in 1996 and 2009 surveys were under 20 inches in length. The population estimate of 5,169 northern pike is much larger than other large lakes in Marinette County (High Falls and Caldron Falls Flowages). Growth rates were also slower than other northeast Wisconsin lakes. This lake has plenty of forage for these predators and these factors are either related to dense aquatic vegetation reducing foraging opportunities or related exploitation factors.

The walleye population indicated a good size structure with a relatively large percentage of legal size fish (greater than 14 inches). The population size of 1,313 walleye is less than 0.60 fish per acre which indicates a low population density. Growth rates were also slow when compared to other area lakes. We did not observe any juvenile fish and question whether natural recruitment is occurring at Lake Noquebay. However, the adult fish caught in nets and captured during electrofishing were highest at the known spawning sites on this lake. Wisconsin DNR stopped stocking walleye into Lake Noquebay in 2000 and the Lake Noquebay Sportsmen Club has resumed this stocking effort with smaller numbers of fish but stocked as larger fall fingerlings. We support this continued stocking practice.

We were encouraged to capture a small number of juvenile and adult muskellunge during the 2009 surveys. The size structure of those 19 musky and their growth rates is

encouraging for this population. Densities appear to be low for a 2,400 acre lake and only 1,000 fall fingerlings were stocked annually. I recommend increasing the musky stocking quota to 2,500 fish. An increased stocking quota and several years of stocking at that rate should develop an improved musky fishery.

The panfish community (bluegill, pumpkinseed, rock bass, yellow perch, and black crappie) is very good as measured through PSD values and growth rates.

Proportional stock densities (PSD) are defined as some length within 20-26% of an angling world record length. 2009 PSD values for walleye, yellow perch and largemouth bass at Lake Noquebay likely indicated balanced populations; while PSD values for northern pike demonstrated an unbalanced population. However, PSD values are only one factor used to manage a fishery. An interesting analysis of growth rates demonstrated that growth rates for most predators (largemouth bass, northern pike and walleye) was slower than normal for Wisconsin lakes while generally growth rates for prey species (bluegill, yellow perch, pumpkinseed, and rock bass) were better than growth rates for other Wisconsin Lakes. These factors may be related to dense aquatic vegetation negatively impacting feeding habitats of predators on the abundant prey community. Weight data was not collected but observations of fish observed during surveys indicated apparently “healthy” fish.

A missing element about our understanding of the fisheries in this lake is exploitation that can best be analyzed with a creel survey for a one year season (open water and ice fisheries). The last open water creel survey was completed in the 1977 and last winter creel was 1982. Those surveys revealed that panfish accounted for a large majority of the harvest at 99% and 87%, respectively. It’s difficult to assume that fishing pressure has not changed in nearly 20 18 years so I recommend a creel survey in the next 5 years. Additional fisheries habitat improvements such as shoreline restoration and placement of coarse woody structure may increase fish recruitment and growth rates. A more aggressive approach to control aquatic vegetation could be an option but may be cost prohibitive. The Lake District and Marinette County cooperate on an annual, minor winter drawdown of 1.0 foot. The scale of the drawdown could be increased periodically as an attempt to freeze out some larger stands of aquatic vegetation. The recent critical habitat report documented important areas for habitat protection and improvement at Lake Noquebay. The current regulations seem to be appropriate although growing

support for a 40 inch statewide muskellunge minimum size limit would offer further protection to that adult fishery. I would recommend a comprehensive survey of these waters in the next 5 years. Public access to Lake Noquebay is adequate. There is also shore access fishing opportunities at the Town landing and County Park. I would recommend no improvements to the current landing facilities.

ACKNOWLEDGEMENTS

I would like to thank Cory Weinandt, Greg Kornely, Mike Hawley, Ron Rhode, Cliff Sebero, John Nelson, Neal Rosenberg, Rod Lange, and Lawrence Eslinger for their assistance in collecting, processing, tabulating and aging the fish from Lake Noquebay. Specifically, Cory Wienandt aged the fish and entered the data into the State database. I also appreciate editorial comments from George Boronow and Dave Rowe.

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TABLES AND FIGURES

TABLE 1. 2010-11 fishing regulations for Lake Noquebay.

Species	Open Season	Daily limit	Minimum length
Largemouth and Smallmouth Bass	1st Saturday May- June 18 June 19- first Sunday in March	0 5 in total	Catch and release 14 inches
Northern Pike	first Saturday in May – first Sunday in March	5	none
Muskellunge	Last Saturday in May – November 30	1	34 inches
Walleye	1 st Sunday May- 1 st Saturday March	5 in total	15 inches
Panfish (bluegill, pumpkinseed, yellow perch, white and black crappie)	Open all year	25 in total	None
Catfish	Open all year	10 in total	None
Rock Bass	Open all year	none	None
Trout species	1 st Sunday May- 1 st Saturday March	5 in total	7 inches

TABLE 2. Catch summary for fyke netting and electrofishing samples from Lake Noquebay, 1996 and 2009. The 1996 fyke net effort was 192 net nights and 185 net nights in 2009. Electrofishing effort was recorded as 4 total miles for game fish and 2 miles for non-game species on September 24 and October 15, 1996. In 2009, electrofishing was completed as 3 miles on April 16, 4 miles on May 4, 2 miles on May 5, 2 miles on June 4, 4 miles on October 13 and 4 miles on October 14. Effort was calculated for 16 total miles for game fish but only 2 miles for non-game fish. An extra night of effort occurred for walleye so 19 total miles for that species alone. Electrofishing effort is expressed as total number of fish per mile.

Species	Fyke netting 1996		Fyke Netting 2009		Electrofishing 1996		Electrofishing 2009	
	Total Catch	Mean Catch per net night	Total Catch	Mean Catch per net night	Total Catch	Mean Catch per mile	Total Catch	Mean Catch per mile
Black Crappie	118	.61	290	1.57	70	35	68	34.0
Yellow Perch	0	-	85	.46	19	9.5	1	0.5
Muskellunge	0	-	19	.10	0	-	1	.06
Bluegill	345	1.79	1928	10.42	81	40.5	128	64.0
Largemouth Bass	62	.32	392	2.12	47	11.75	165	10.3
Northern Pike	612	3.19	508	2.75	37	9.25	27	1.7
Rock Bass	241	1.26	1130	6.11	22	11.0	13	6.5
Smallmouth Bass	0	-	2	.01	0	-	1	.06
Walleye	330	1.72	630	3.41	23	5.75	89	4.7
Pumpkinseed	30	.16	252	1.36	4	2.0	13	6.5
Bullhead species	135	.70	402	2.17	2	1.0	2	1.0

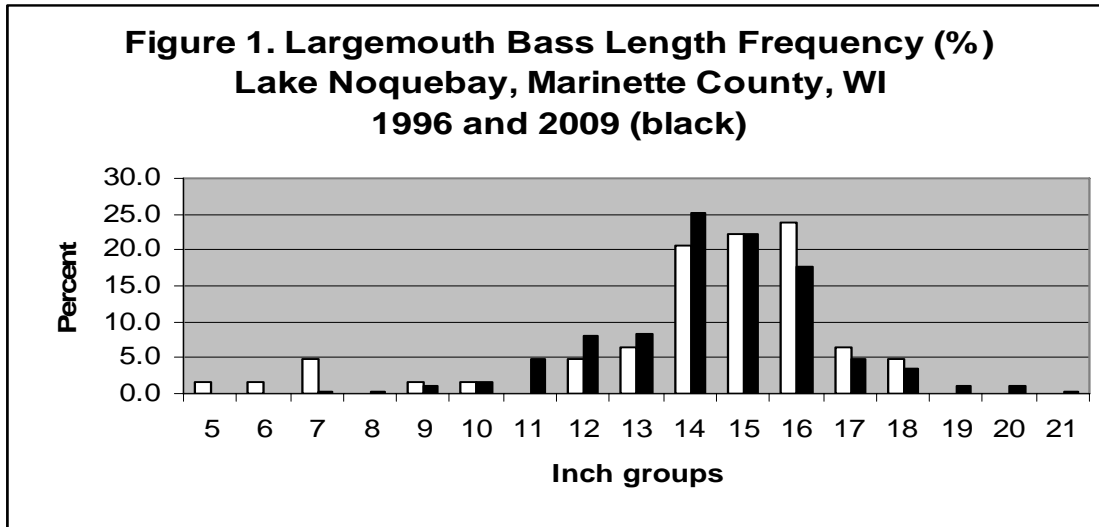
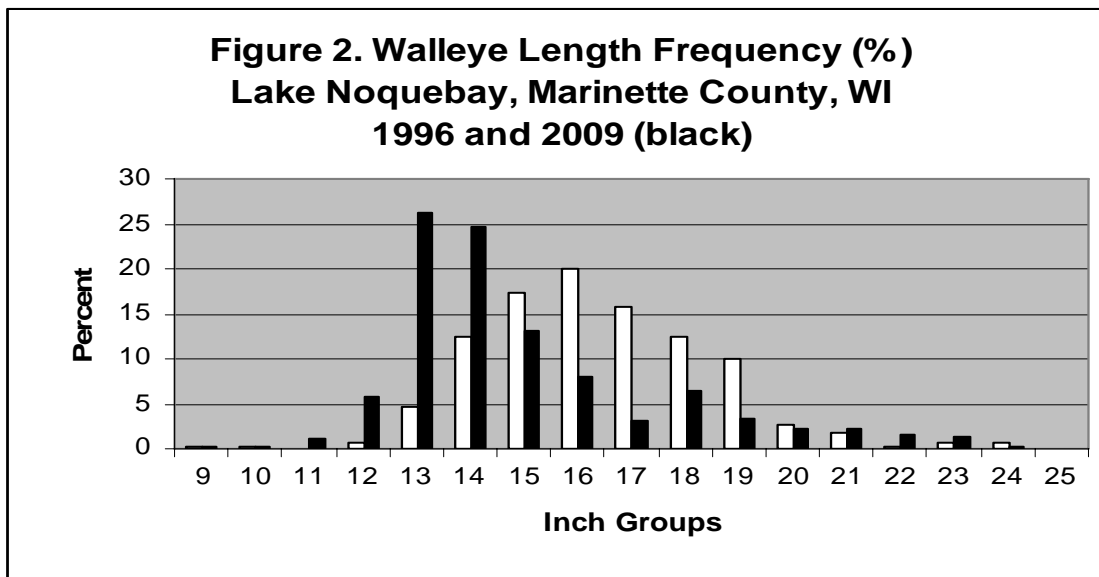


Table 3. 2009 Age-length distribution of largemouth bass from Lake Noquebay, Marinette County, Wisconsin compared to Northeast (NER) Wisconsin average length at age data. N equals sample size.

Age	3	4	5	6	7	8	9	10	11	12	13	14	15
NER Average	9.6	11.5	13.3	14.9	16.5	18.3	18.2	18.8	19.6	19.5	19.2	20.2	21.0
2009 Survey	10.8	11.5	12.5	14.0	14.8	15.6	16.0	17.1	17.4	17.9	18.4	18.8	19.7
2009 (N)	8	14	10	8	7	10	3	8	5	6	3	3	5



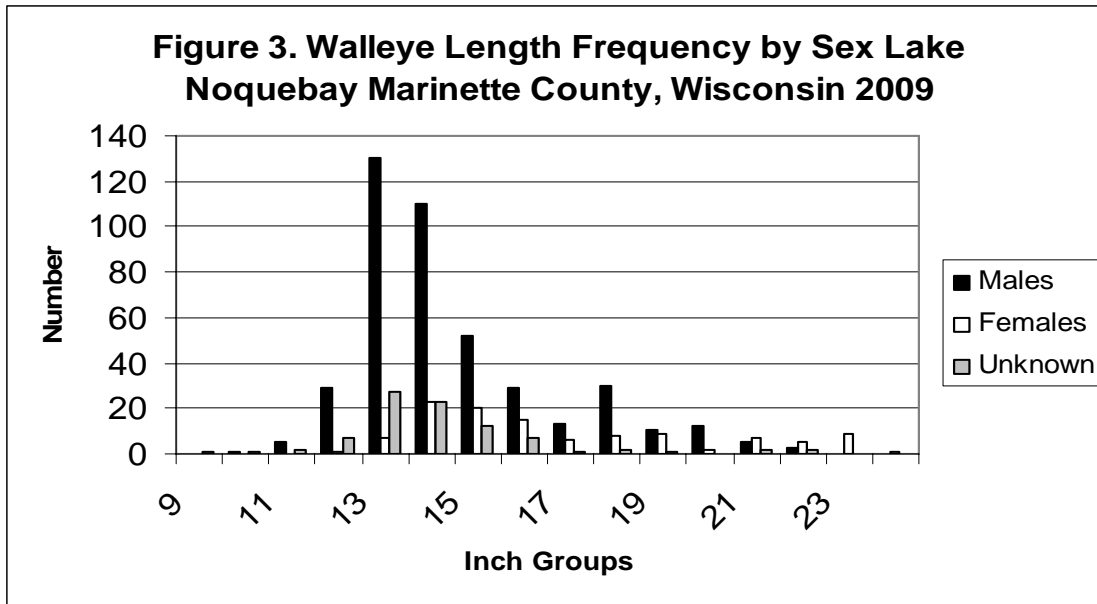
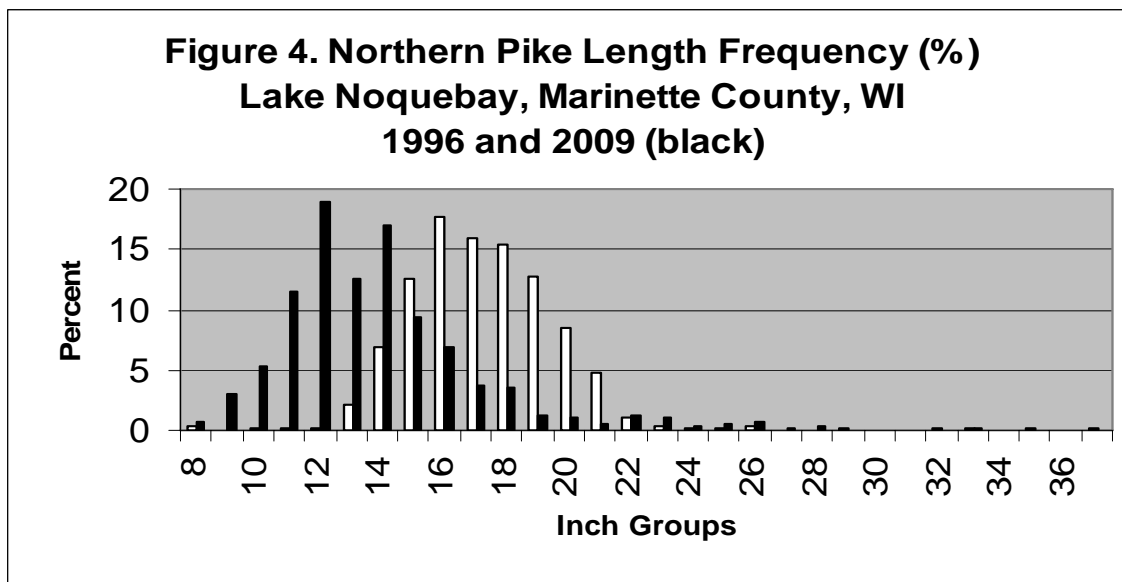


Table 4. 2009 Age- length distribution of walleye from Lake Noquebay, Marinette County, Wisconsin compared to Northeastern (NER) Wisconsin average length at age data. N equals sample size.

Age	3	4	5	6	7	8	9	10	11	12	13	14	15
NER Average	13.6	16.4	18.0	19.1	21.2	22.5	23.9	26.7	26.3	27.0	25.9	27.9	28.7
2009 Survey	11.7	14.2	15.8	17.5	18.5	18.3	19.8	21.7	20.8	21.1	20.8	22.3	22.4
2009 (N)	12	64	30	25	9	5	10	8	5	7	3	6	1



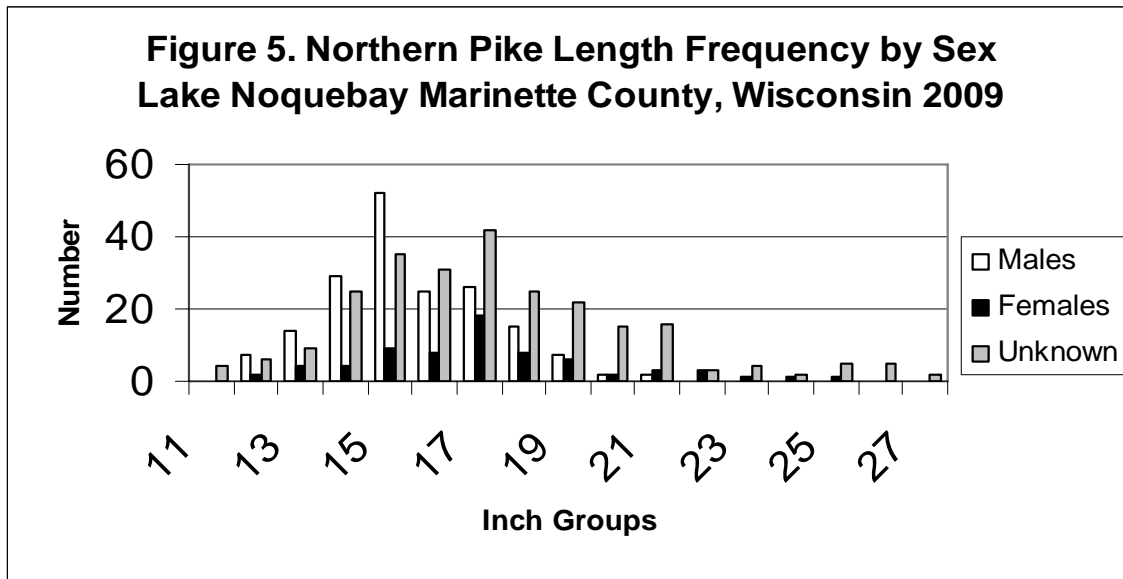


Table 5. Age- length distribution of northern pike from Lake Noquebay, Marinette County, Wisconsin compared to Wisconsin average length at age data. N equals sample size.

Age	2	3	4	5	6	7	8	9	10	11	12	13	14
State Average	14.7	17.8	20.5	23.2	25.2	28.3	30.6	32.5	32.9	37.5	38.6	38.6	41.0
2009 Survey	13.8	15.5	17.4	18.9	20.5	23.0	25.7	27.5	29.4	30.1	30.6	31.6	36.5
2009 (N)	51	33	31	22	30	17	7	4	3	2	2	1	1

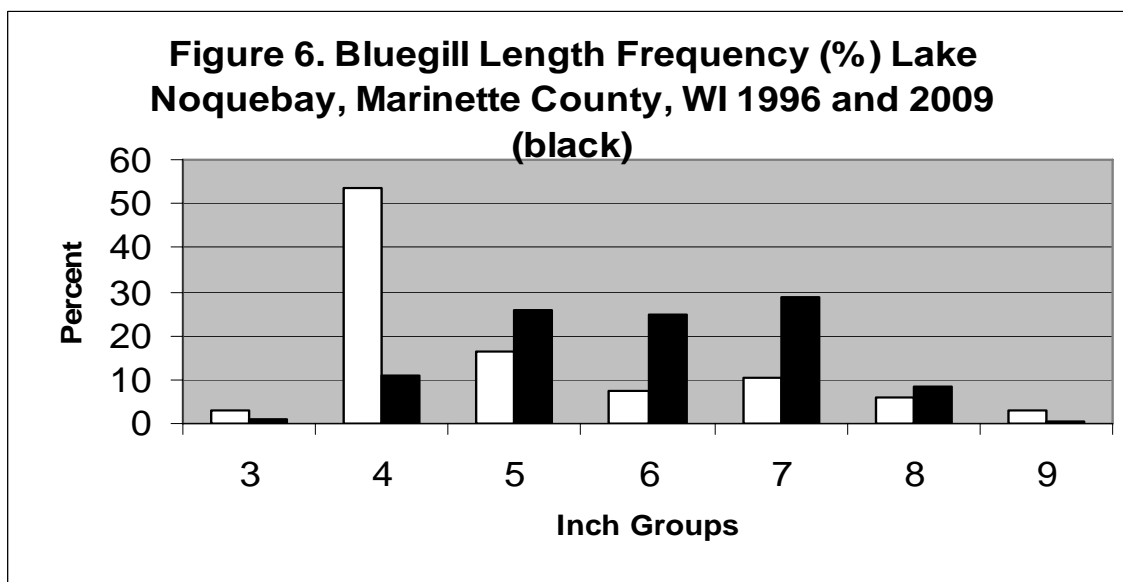


Table 6. Age- length distribution of bluegill from Lake Noquebay, Marinette County, Wisconsin compared to NER Wisconsin average length at age data. N equals sample size.

Age	2	3	4	5	6	7	8	9
NER Average	4.0	4.8	5.8	6.6	7.2	7.9	8.3	8.7
2009 Survey	4.1	4.8	5.4	6.4	7.3	8.0	8.4	9.2
2009 (N)	6	29	26	8	10	15	7	3

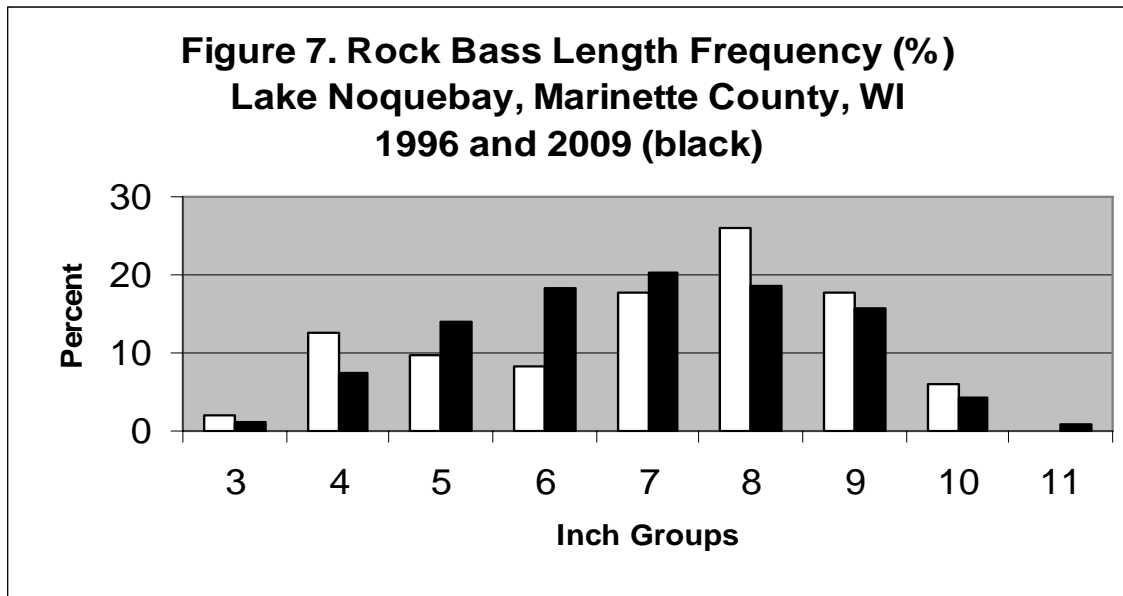


Table 7. Age- length distribution of rock bass from Lake Noquebay, Marinette County, Wisconsin compared to Wisconsin average length at age data. N equals sample size.

Age	3	4	5	6	7	8	9	10
State Average	5.3	6.3	7.1	8.0	8.5	9.0	9.5	9.7
2009 Survey	4.3	5.8	7.7	9.0	9.6	10.2	10.5	11.1
2009 (N)	14	22	30	20	5	5	3	2

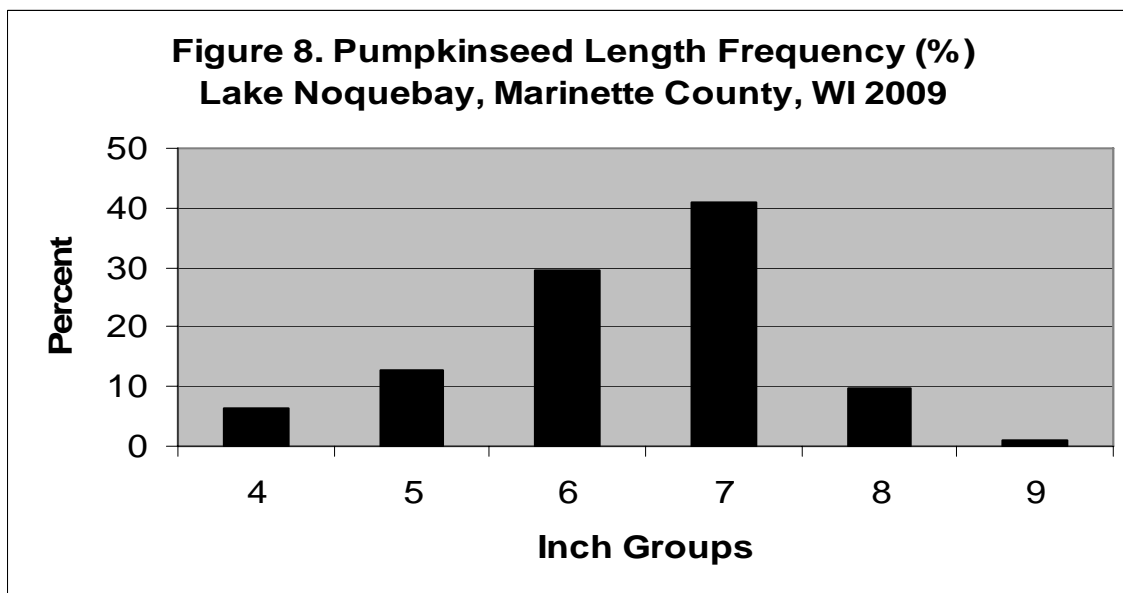


Table 8. Age- length distribution of pumpkinseed from Lake Noquebay, Marinette County, Wisconsin compared to Wisconsin average length at age data. N equals sample size.

Age	3	4	5	6	7	8
State Average	4.8	5.4	6.1	6.6	7.0	7.3
2009 Survey	4.0	5.7	6.9	7.6	8.1	7.7
2009 (N)	1	11	9	3	3	1

Figure 9. Black Crappie Length Frequency (%)
Lake Noquebay, Marinette County, WI
1996 and 2009 (black)

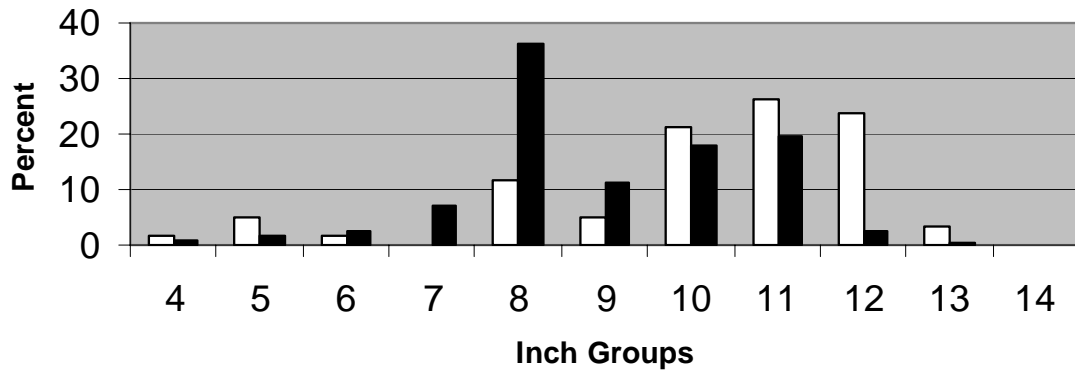
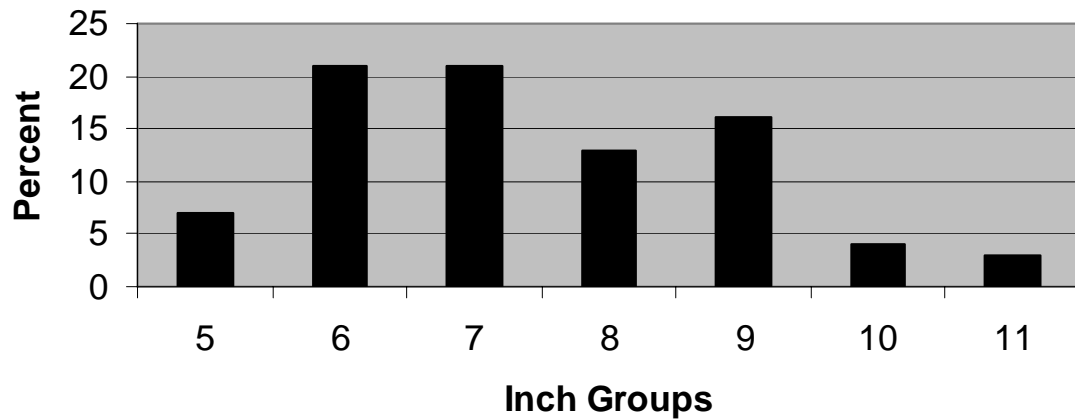


Table 9 Age- length distribution of black crappie from Lake Noquebay, Marinette County, Wisconsin compared to NER Wisconsin average length at age data. N equals sample size.

Age	2	3	4	5	6	7	8	9
NER Average	5.3	7.2	8.7	9.7	10.5	11.2	12.2	13.0
2009 Survey	5.1	7.2	8.4	10.1	10.9	11.6	12.2	12.5
2009 (N)	14	22	30	20	5	5	3	2

Figure 10. Yellow Perch Length Frequency (%)
Lake Noquebay Marinette County, WI 2009



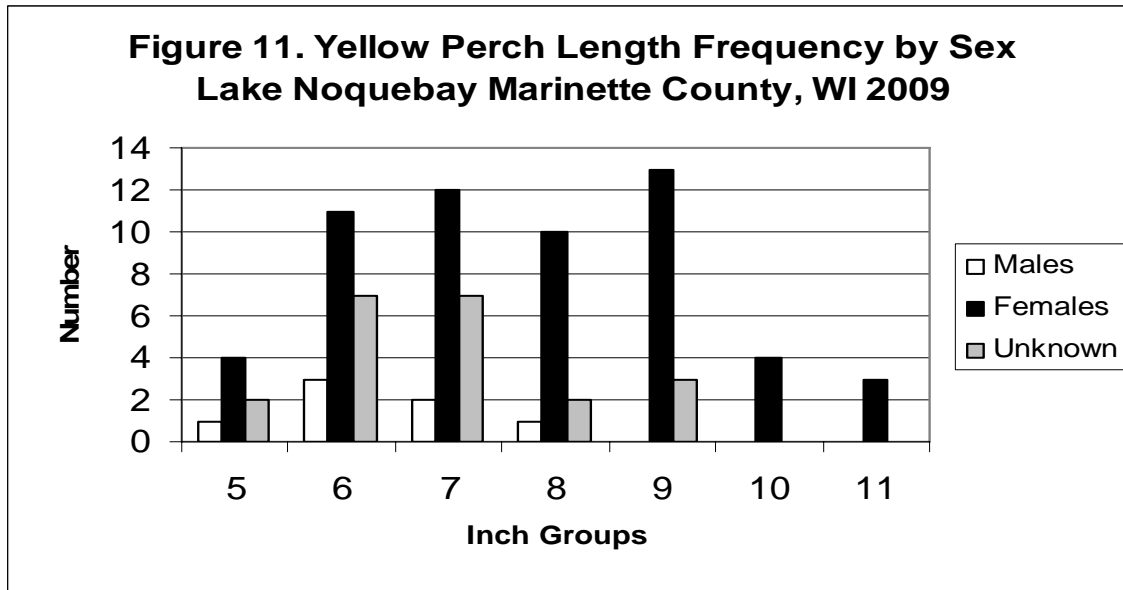


Table 10. Age- length distribution of yellow perch from Lake Noquebay, Marinette County, Wisconsin compared to NER Wisconsin average length at age data. N equals sample size.

Age	3	4	5	6	7
NER Average	6.6	7.4	8.3	9.1	10.6
2009 Survey	6.6	7.3	8.9	9.6	11.2
2009 (N)	12	27	11	11	1

Table 11. Age- length distribution of muskellunge from Lake Noquebay, Marinette County, Wisconsin compared to NER Wisconsin average length at age data. N equals sample size.

Age	1	4	5	6	7	8	9	10
NER Average	12.7	27.7	31.3	33.9	37.6	36.7	41.2	40.4
2009 Survey	12.0	28.6	36.0	--	36.2	36.0	42.7	40.0
2009 (N)	1	1	1	0	3	2	7	3

